

EVIDENCE-BASED STUDENT SUCCESS INTERVENTIONS AND PROGRAMS: A DESIGN GUIDE FOR APLU INSTITUTIONS

AUGUST 2023



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The association and its members collectively focus on: increasing access, equity, completion, and workforce readiness; promoting pathbreaking scientific research; and bolstering economic and community engagement. Drawing on the powerful collective action of its members, APLU's advocacy arm helps shape federal policy that maximizes the positive impact of public and land-grant universities.

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The Coalition of Urban Serving Universities (USU) is a president-led organization committed to enhancing urban university engagement and tackling key urban challenges in our nation's cities. The Coalition membership includes 42 public, urban research universities across 27 states. Annually, member campuses enroll over 1 million students, confer 276,000 degrees, employ 195,000 faculty and staff, and conduct \$4.6 billion in university research. The Coalition of Urban Universities (USU) has partnered with the Association of Public and Land-grant Universities (APLU) to establish an Office of Urban Initiatives, housed at APLU, to jointly lead an urban agenda for the nation's public universities.

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BACKGROUND

The [Association of Public & Land-grant Universities](#) (APLU) and the [Coalition of Urban Serving Universities](#) (USU), supported by Arnold Ventures, LLC, have partnered to further promote federal investment in evidence-based strategies that will improve postsecondary retention and completion. APLU is an association of more than 250 public research universities, land-grant institutions, state university systems, and affiliated organizations focused on increasing access, equity, completion, and workforce readiness. USU a president-led network of 41 public urban research universities working to drive transformational change throughout their institutions and the communities they serve. Arnold Ventures is a philanthropy working to improve the lives of all Americans by pursuing evidence-based solutions to our nation’s most pressing problems. Each organization has its own equity goals and expertise in evidence-based student success programs, but for this initiative, APLU and USU are targeting support to APLU/USU member institutions.

The goal is to elevate evidence-based student success strategies, promote collaboration and knowledge sharing among peers, and offer resources and technical assistance to support member universities interested in applying for the [Department of Education’s Postsecondary Student Success Program](#) (PSS) grant.

In a time of limited resources and continued need to improve student success, institutions must carefully consider where to invest resources to create the biggest impact on student outcomes. Designing and implementing evidence-based programs not only ensures that students will benefit from a practice that has been intentionally studied and tested but also that the institution is wisely investing limited resources on effective and impactful practices. Thus, the PSS funds evidence-based student success interventions. The 2023 application for PSS [opened](#) on July 26th and will close on September 25th, giving institutions a limited window to prepare and submit the application.

To be successful applicants for ED’s PSS grant, institutions are expected to propose student success strategies that are supported by “evidence,” as defined in the U.S. Department of Education’s What Works Clearinghouse (WWC) and include “evidence” as part of the program design and evaluation in their proposals. Yet for many under-resourced institutions facing barriers such as limited resources, access to research expertise, or difficulties in navigating the grant application process, beginning an application for federally-supported evidence-based student success interventions can be quite daunting.

This guide – developed to support public 4-year institutions in understanding the requirements for the PSS and help them develop strong, evidence-based proposals – serves as a resource for institutions by:

- Providing common definitions for “evidence” or “evidence-based” and related experimental design terminology in one place that potential applicants can reference,
- Describing various tiers of evidence-based interventions, strategies, programs, and
- Sharing examples of programs under each tier of evidence.

APLU encourages institutions to take advantage of this timely guide’s resources to streamline their application development process within the limited application window for the PSS.

DEFINITIONS OF “EVIDENCE” OR “EVIDENCE-BASED”

To help institutions design student success interventions that are “evidence-based”, APLU along with the help of ASA Research conducted a landscape scan of federal agencies, educational and evaluation organizations, and foundations – both those within and outside the education sector – for definitions of “evidence” and “evidence-based.” The search yielded a total of 27 different definitions. Of those, 14 definitions were sufficiently comprehensive and relevant for inclusion in analysis (see Appendix A for the definitions and links to where they could be explored further).

Definitions were categorized as rigorous or general. The former, **rigorous** definitions, have a level of specificity about the statistical methods required to be defined as evidence. For example, the U.S. Department of Education (ED) oft-cited What Works Clearinghouse (WWC) standards require rigorous methods such as experimental design to meet the highest levels of acceptable evidence. On the other hand, the more **general** definitions emphasize evidence usage or student outcomes rather than the data or methods used to produce evidence. Table 1 includes definitions from three selected organizations with more rigorous definitions.

Table 1. Examples of rigorous definitions of “evidence” or “evidence-based”

ORGANIZATION INITIATIVE/TITLE	DEFINITION
ED, What Works Clearinghouse (WWC)	<i>Ratings of Strong¹, Moderate², or Promising³ evidence or Evidence that demonstrates a rationale based on rigor of research, methods, and significance of findings. The lowest tier is not based on research findings but “should indicate that the project component is likely to improve a relevant outcome.”</i>
Mathematica, Education to Workforce Indicator Framework	<i>Informed and supported by rigorous evidence demonstrating consistent, positive impacts on individual outcomes. (As a reminder, the PSS program uses the WWC definition, but the Mathematica definition can be useful for non-PSS implementation of evidence-based interventions.)</i>
MDRC, College Completion Strategy Guide	<i>Policies and practices evaluated in well-designed experimental studies and successfully replicated in other contexts. (As a reminder, the PSS program uses the WWC definition, but the MDRC definition can be useful for non-PSS implementation of evidence-based interventions.)</i>

¹ A design that receives the highest rating of Meets WWC Standards without Reservations. <https://ies.ed.gov/ncee/wwc/glossary>

² Limited evidence for a practice guide recommendation. This rating is assigned when the panel finds high quality causal research that links a practice with positive results, but the research may not adequately rule out other causes of the positive results, or the school and classrooms are not similar to those targeted by the guide. <https://ies.ed.gov/ncee/wwc/glossary>

³ Promising evidence means “...there is evidence of the effectiveness of a key project component in improving a relevant outcome, based on a relevant finding from” one of the following: (i) A practice guide prepared by What Works Clearinghouse (WWC) reporting a ‘strong evidence base’ or ‘moderate evidence base’ for the corresponding practice guide recommendation; (ii) An intervention report prepared by the WWC reporting a ‘positive effect’ or ‘potentially positive effect’ on a relevant outcome with no reporting of a ‘negative effect’ or ‘potentially negative effect’ on a relevant outcome; or (iii) A single study assessed by the Department, as appropriate, that— (A) Is an experimental study, a quasi-experimental design study, or a well-designed and well-implemented correlational study with statistical controls for selection bias (e.g., a study using regression methods to account for differences between a treatment group and a comparison group); and (B) Includes at least one statistically significant and positive (i.e., favorable) effect on a relevant outcome.” <https://ies.ed.gov/ncee/wwc/essa>

ED'S POSTSECONDARY STUDENT SUCCESS (PSS) PROGRAM

While all three organizations share several common research terms in their definitions, the PSS references the WWC standards in its selection criteria. For fiscal year 2023, ED will provide approximately \$44.55 million in total grants to institutions, with 50 percent of the funds going to “Early-phase” grantees and the other 50 percent going to “Mid-phase/Expansion” grantees. For each type of grant, APLU has created a summary in Figures 1 and 2 of what ED will fund, require in terms of evidence, require in terms of program evaluation, and recommend in the program design.

Figure 1. About the PSS **Early-Phase Grant** (\$2M - \$4M for 48 months, 10% institutional matching)

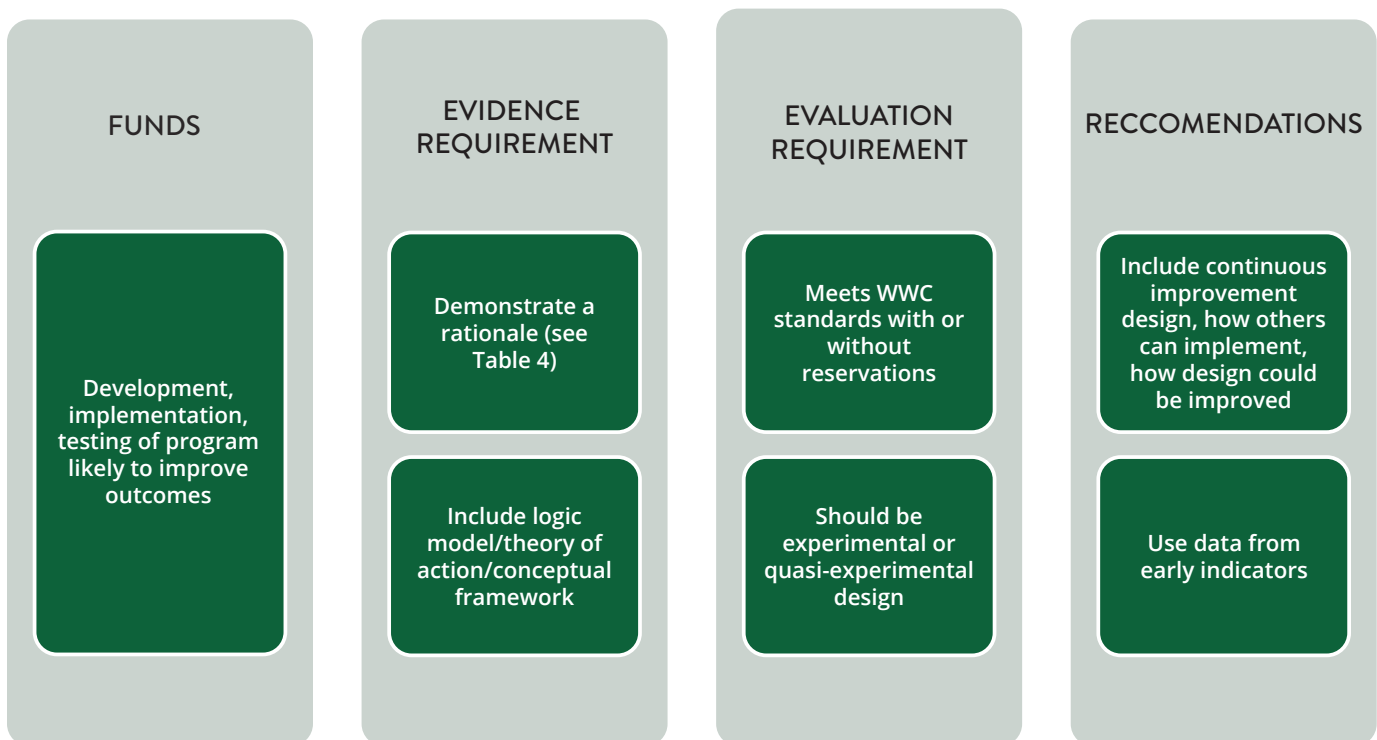
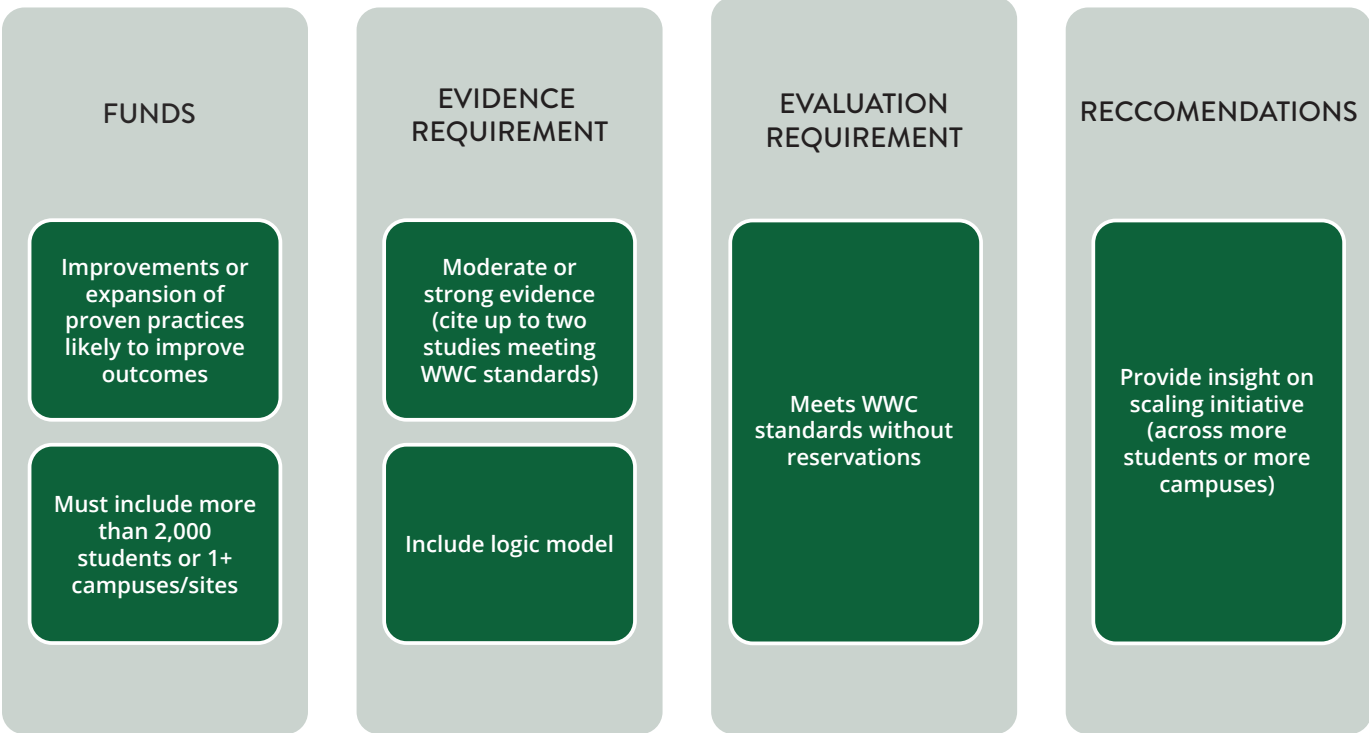


Figure 2. About the PSS **Mid-Phase Grant** (\$6M - \$8M for 48 months, 10% institutional matching)



RESEARCH METHODS

Definitions of “evidence” or “evidence-based” typically include guidelines for the types of research that can be used to test or evaluate interventions, based on the rigor of the evaluation. The inclusion of research methods is crucial in designing evidence-based student success interventions for the PSS, as it establishes the credibility and validity of the proposed interventions and their potential to improve student outcomes. When pursuing the PSS grant, institutions should carefully consider and include recommended research methods that align with the type of grant for which they are applying.

Research methods, also known as experimental designs, can vary in rigor, from more specific and stringent approaches to broader and inclusive ones. Even within the more rigorous WWC standards, there are categories for less rigorous research methods, such as non-statistically significant findings or mixed positive/negative/inconclusive outcomes, which would be considered as “demonstrating a rationale” (the lowest evidence tier) for the intervention, if the research is of high quality and meets the guidelines’ requirements within that category. Table 2 contains definitions for common research terminologies from the WWC glossary, which will be referenced by the PSS grant.

Table 2. Common Research Terms from the WWC Glossary

KEY TERM	DEFINITION
Casual	Evidence that an observed effect is a consequence of the intervention.
Comparison Group Design	A study design in which outcomes for a group receiving an intervention are compared to those for a group not receiving the intervention. Comparison group designs eligible for WWC review are randomized controlled trials, quasi-experimental designs, and regression discontinuity designs.
Design	The method by which intervention and comparison groups are assigned (group design and regression discontinuity design) or the method by which an outcome measure is assessed repeatedly within and across different phases that are defined by the presence or absence of an intervention (single-case design). Designs eligible for WWC review are randomized controlled trials, quasi-experimental designs, regression discontinuity designs, and single-case designs.
Effect Size	A standardized measure of the magnitude of an effect. The effect size represents the change (measured in standard deviations) in an average student’s outcome that can be expected if that student is given the intervention. Because effect sizes are standardized, they can be compared across outcomes and studies.
Group Design	A study design in which outcomes for a group receiving an intervention are compared to those for a group not receiving the intervention. Comparison group designs eligible for WWC review are randomized controlled trials and quasi-experimental designs.
Internal Validity	The study provides credible evidence of the effect of the intervention on study participants — and that the effect is not due to other factors.
Intervention	An educational program, product, practice, or policy aimed at improving student outcomes.
Quasi-experimental Design	A design in which groups are created through a process that is not random. For a quasi-experimental design to be rigorous, the intervention and comparison groups must be similar, demonstrating baseline equivalence on observed characteristics, before the intervention is started. Strong quasi-experimental designs will, at best, be rated as Meets WWC Group Design Standards with Reservations.

KEY TERM	DEFINITION
Outcome	Knowledge, skills, attitudes, and other desired benefits that are attained as a result of an activity. To examine the effectiveness of an intervention for the WWC, eligible research must compare the outcome for a group receiving the intervention to the outcome for a group not receiving the intervention. An outcome measure is an instrument, device, or method that provides data on the outcome. An outcome domain is a group of closely related outcome measures, believed to provide information on the same underlying skill or ability.
Outcome Measure	The instrument, device, or method that provides data on the knowledge, skills, attitudes, behaviors or other measurable characteristics that researchers assess to learn about the impact of an intervention.
Randomized Control Trial	A design in which groups are created through a process that is random. Carried out correctly, random assignment results in groups that are similar on average in both observable and unobservable characteristics, and any differences in outcomes between the groups are due to the intervention alone. Strong randomized controlled trials can receive the highest rating of Meets WWC Group Design Standards without Reservations.
Regression Model	A statistical method used to estimate the impacts of the intervention, possibly controlling for measured characteristics of sample members.
Statistical Significance	The likelihood that a finding is due to chance rather than a real difference. The WWC labels a finding statistically significant if the likelihood that the difference is due to chance is less than five percent ($p = 0.05$).
Study	An examination of the effect of an intervention on a particular sample and set of outcomes. In most cases, the results of a study are presented in a single article or manuscript. A study may also present results over multiple manuscripts, such as an examination of a beginning reading program that analyzes both immediate and long-term effects of an intervention on a common sample that is reported on in manuscripts produced over several years. In contrast, a single manuscript may contain multiple studies, such as an examination of a dropout prevention program analyzed separately in three different cities.

Because the WWC glossary doesn't contain all common research terms, the following were sourced from other organizations to enhance the understanding of research methodologies applied beyond the WWC standards.

Table 3. Common Research Terms from Other Sources

KEY TERM	DEFINITION
Descriptive Research ⁴	Summarizes the outcomes of individuals supported by the intervention over a period of time (for example, showing outcomes improved after the intervention was implemented)
Correlational Research ⁵	Suggests a relationship between the intervention and outcomes (for example, showing individuals supported by the intervention had better outcomes than those who were not)
Quantitative Research ⁶	Set of strategies, techniques and assumptions used to study psychological, social and economic processes through the exploration of numeric patterns. Quantitative research gathers a range of numeric data. Quantitative research includes methodologies such as questionnaires, structured observations or experiments and stands in contrast to qualitative research.
Qualitative Research ⁷	Process of naturalistic inquiry that seeks an in-depth understanding of social phenomena within their natural setting. It focuses on the "why" rather than the "what" of social phenomena and relies on the direct experiences of human beings as meaning-making agents in their every day lives. Rather than by logical and statistical procedures, qualitative researchers use multiple systems of inquiry for the study of human phenomena including biography, case study, historical analysis, discourse analysis, ethnography, grounded theory, and phenomenology.

⁴“Education-to-Workforce indicator framework: Using data to promote equity and economic security for all.” Seattle: Mathematica, August 2022. Available at https://educationtoworkforce.org/sites/default/files/2023-04/E-W-Indicator-Framework_Final.pdf

⁵ Ibid.

⁶ “Quantitative and Qualitative Research.” University of Texas Arlington Libraries. Available at https://libguides.uta.edu/quantitative_and_qualitative_research/differences

⁷ Ibid.

TIERS OF EVIDENCE AND EXAMPLES

When designing student success programs, institutions should not only adhere to rigorous definitions of evidence and research methods but also consider which tier of evidence is feasible and appropriate for their intervention or program. This guide offers descriptions of tiers of evidence, arranged from the most to the least rigorous, along with practical examples sourced from WWC (Table 3), which is the standard used in the PSS selection criteria.

It is important to note that while the WWC database includes interventions and programs tested and/or replicated under rigorous conditions, it may not encompass the full spectrum of strategies implemented in diverse settings and for various student populations. For a more comprehensive set of examples, institutions can explore additional databases, such as those shared from Mathematica's Education to Workforce Indicator and MDRC's College Completion Strategy Guide (see Appendix C and D). These resources contain a broader range of evidence-based interventions, offering valuable insights and ideas for improving student success in various contexts.

Table 4. Tiers of Evidence and Examples from the What Works Clearinghouse (WWC)

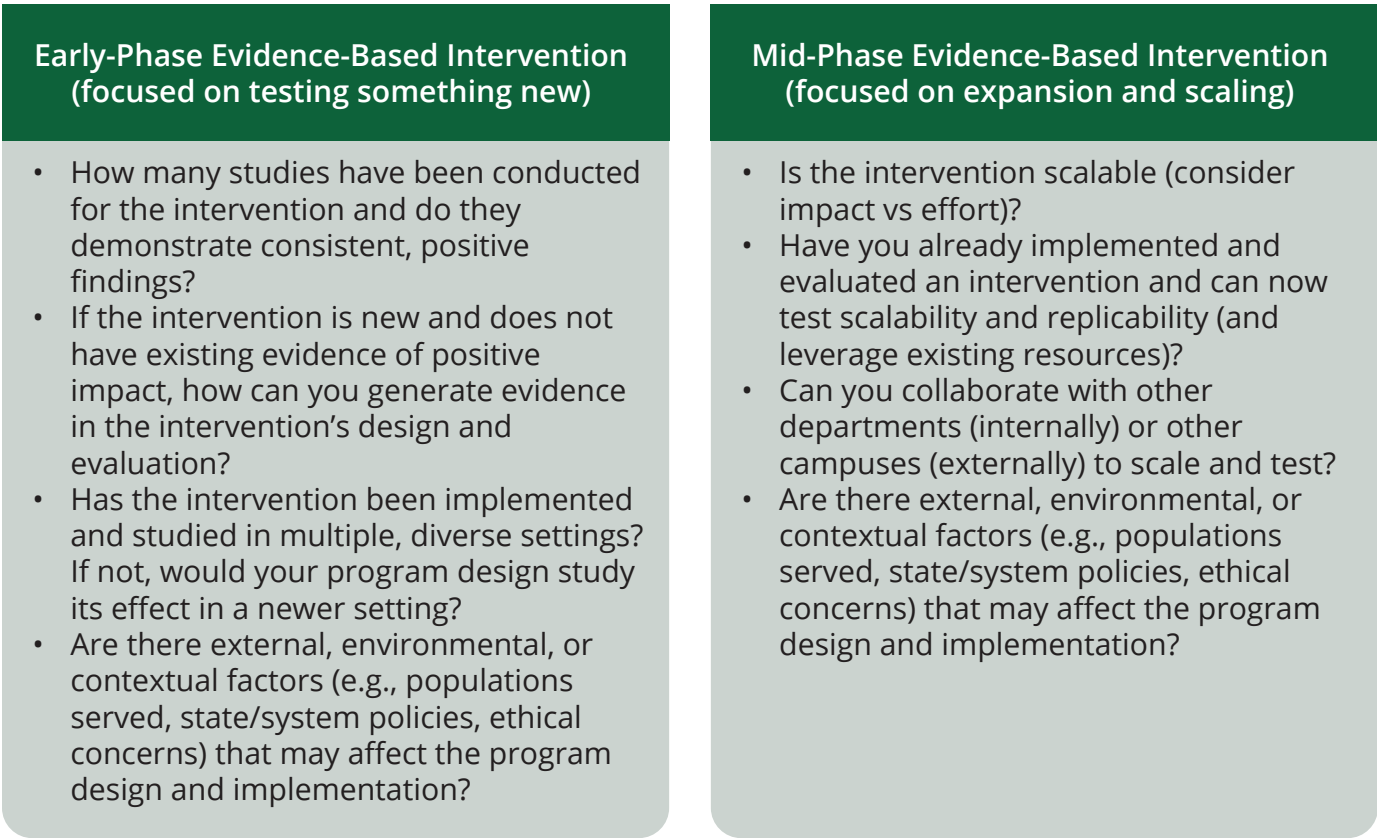
	TIER 1: STRONG EVIDENCE	TIER 2: MODERATE EVIDENCE	TIER 3: PROMISING EVIDENCE	TIER 4: EVIDENCE FOR RATIONAL
DESCRIPTION	"...based on at least 1 well-designed, well-implemented experimental study demonstrating a statistically significant and positive effect of a project component on a relevant outcome."	"...based on at least 1 well-designed, well-implemented quasi-experimental design study demonstrating a statistically significant and positive effect of a project component on a relevant outcome."	"...based on at least 1 well-designed, well-implemented correlational study with statistical controls for selection bias demonstrating a statistically significant and positive effect of a project component on a relevant	"...does not need to be based on research with a statistically significant finding or that has been reviewed by the WWC, but should indicate that the project component is likely to improve a relevant outcome."
INTERVENTION	Dana Center Mathematics Pathways (DCMP) "...offers multiple math pathways aligned to programs of study, accelerated enrollment in credit-bearing college math courses, integrated student supports, and math instruction that incorporates evidence-based curricula and pedagogy." More information: https://ies.ed.gov/ncee/wwc/Docs/InterventionReports/WWC_DCMP_IR-report.pdf	Single Stop USA's Community College Initiative "supports community college students with screening and applications for public benefits and other wraparound services that can include housing, food assistance, tax preparation, child care, financial and legal services, and immigration consultations." More information: https://ies.ed.gov/ncee/wwc/Docs/InterventionReports/WWC_IR_Single_Stop_Report_Nov2020.pdf	Bottom Line Transition to College "... provides intensive advising for low-income high school students, most of whom are the first in their family to go to college. The advising is designed to help students apply for college and financial aid and select a high-quality, affordable institution." More information: https://ies.ed.gov/ncee/wwc/Docs/InterventionReports/WWC_IR_Bottom-Line_REPORT_508.pdf	Developmental Summer Bridge Programs provide "...accelerated instruction in areas where additional knowledge and skills are needed..." More information: https://ies.ed.gov/ncee/wwc/Docs/InterventionReports/wwc-summerbridge_031715.pdf
EVIDENCE	One Randomized Control Trial (RCT) study met WWC group design standards without reservations and two Quasi-Experimental Design (QED) studies met WWC group design standards with reservations. The studies "... showed evidence of a positive and statistically significant effect of DCMP on progressing in developmental education... [and] progressing in college."	Two QED studies met WWC group design standards with reservations. They "...showed evidence of a positive and statistically significant effect of Single Stop on progressing in college and [both] statistically significant... [and] indeterminate effect...on academic achievement."	One RCT study met WWC group design standards without reservations and "...showed evidence of a positive and statistically significant effect of Bottom Line on college enrollment and progressing in college."	One RCT study met WWC group design standards without reservations. Nine studies did not meet WWC group design standards. "The effects of developmental summer bridge programs on academic achievement, postsecondary enrollment, and credit accumulation for postsecondary students were neither statistically significant nor large enough to be considered substantively important."

Source: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, What Works Clearinghouse. <https://ies.ed.gov/ncee/wwc/>

QUESTIONS FOR CONSIDERATION WHEN SELECTING AN EVIDENCE-BASED INTERVENTION

While causal research and randomized controlled trials provide the most rigorous forms of evidence for student success, not all types of interventions or programs can be feasibly or ethically studied using those research methods. When selecting the intervention to implement and test and the research method to apply to the evaluation, institutions can use the questions below to guide their decision-making.

Figure 3. Questions to consider when selecting an evidence-based intervention



In a 2021 Education Week article entitled ‘What Does It Mean to Call a Program ‘Evidence-Based’ Anyway?’ insightful advice was provided, suggesting the importance of looking beyond research methodology. When the evidence for an intervention is mixed, it becomes essential to scrutinize various factors, such as the characteristics of the students served, the specific outcomes improved, and the skills and resources required for program implementation. If these factors do not align with your own context and goals, especially in studies that have shown positive results, caution should be exercised about the likelihood of replicating the same outcomes.

Therefore, in addition to considering research methods in the evidence definition, it is worthwhile to evaluate contextual and environmental factors. These factors may include the populations served by a practice or program and the nature of the intervention itself. Taking

a comprehensive approach to selecting research methods that match the specific context of an institution can significantly enhance the prospects of achieving positive and replicable results in student success.

Figure 4. Questions to consider when selecting a research method



As institutions contemplate how they will design and implement evidence-based student success programs that fit their unique institutional contexts, APLU hopes that this guide has provided valuable foundational knowledge about the opportunities the PSS grant presents. By understanding the requirements of the grant and considering the questions and examples provided, campuses can develop robust and tailored program designs to increase their chances of success in the grant application process. Additionally, below, you will find additional resources that offer insights into developing logic models—a crucial component of the grant—and, more broadly, fostering effective program design. APLU is committed to supporting member universities in their pursuit of evidence-based strategies to improve postsecondary retention and completion, and we trust that this guide will prove to be a valuable asset in your journey towards student success.

- WWC Procedures and Standards Handbooks: <https://ies.ed.gov/ncee/wwc/Handbooks>
- “Technical Assistance Materials for Conducting Rigorous Impact Evaluations”: <https://ies.ed.gov/ncee/projects/evaluationTA.asp>
- IES/NCEE Technical Methods papers: https://ies.ed.gov/ncee/tech_methods/
- Webinar focused on more rigorous evaluation designs, discussing strategies for designing and executing experimental studies: <https://ies.ed.gov/ncee/wwc/Multimedia/18.>
- Logic Model Resources
 - » <https://ies.ed.gov/ncee/rel/regions/pacific/pdf/ELMUserGuideJune2014.pdf>
 - » https://ies.ed.gov/ncee/edlabs/regions/pacific/pdf/REL_2014025.pdf
 - » https://ies.ed.gov/ncee/edlabs/regions/northeast/pdf/REL_2015057.pdf

APPENDIX

APPENDIX A: LANDSCAPE SCAN OF “EVIDENCE” OR “EVIDENCE-BASED” DEFINITIONS

ORGANIZATION	INITIATIVE/TITLE	DEFINITION	RIGOROUS OR GENERAL DEFINITION
Bipartisan Policy Center	Evidence Works: Cases Where Evidence Meaningfully Informed Policy	High-quality information constructed by systematically collecting data , analyzing data with rigorous research methods , then developing conclusions that are valid and reliable about groups of people, households, families, or organizations.	Rigorous
ED/Institute of Education Sciences	Every Student Succeeds Act (ESSA)	An activity, strategy, or intervention that demonstrates a statistically significant effect on improving student outcomes or other relevant outcomes based on Strong ⁸ , Moderate ⁹ , or Promising ¹⁰ evidence OR demonstrates a rationale based on high quality research findings or positive evaluation that such activity, strategy, or intervention is likely to improve student outcomes...and includes ongoing efforts to examine the effects of such activity, strategy, or intervention.	Rigorous

⁸ A design that receives the highest rating of Meets WWC Standards without Reservations. <https://ies.ed.gov/ncee/wwc/glossary>

⁹ Limited evidence for a practice guide recommendation. This rating is assigned when the panel finds high quality causal research that links a practice with positive results, but the research may not adequately rule out other causes of the positive results, or the school and classrooms are not similar to those targeted by the guide. <https://ies.ed.gov/ncee/wwc/glossary>

¹⁰ Promising evidence means “...there is evidence of the effectiveness of a key project component in improving a relevant outcome, based on a relevant finding from” one of the following: (i) A practice guide prepared by What Works Clearinghouse (WWC) reporting a ‘strong evidence base’ or ‘moderate evidence base’ for the corresponding practice guide recommendation; (ii) An intervention report prepared by the WWC reporting a ‘positive effect’ or ‘potentially positive effect’ on a relevant outcome with no reporting of a ‘negative effect’ or ‘potentially negative effect’ on a relevant outcome; or (iii) A single study assessed by the Department, as appropriate, that— (A) Is an experimental study, a quasi-experimental design study, or a well-designed and well-implemented correlational study with statistical controls for selection bias (e.g., a study using regression methods to account for differences between a treatment group and a comparison group); and (B) Includes at least one statistically significant and positive (i.e., favorable) effect on a relevant outcome.” <https://ies.ed.gov/ncee/wwc/essa>

ORGANIZATION	INITIATIVE/TITLE	DEFINITION	RIGOROUS OR GENERAL DEFINITION
ED/Institute of Education Sciences	What Works Clearinghouse (WWC)	High-quality information constructed by systematically collecting data, analyzing data with rigorous research methods, then developing conclusions that are valid and reliable about groups of people, households, families, or organizations.	Rigorous
Mathematica	Education to Workforce Indicator Framework	<i>Informed and supported by rigorous evidence demonstrating consistent, positive impacts on individual outcomes.</i>	Rigorous
MDRC	College Completion Strategy Guide	<i>Policies and practices evaluated in well-designed experimental studies and successfully replicated in other contexts.</i>	Rigorous
Vanderbilt IRIS Center	What is an Evidence-Based Practice or Program?	<i>Evidence-Based Practice: Skills, techniques, and strategies that have been proven to work through experimental research studies or large-scale research field studies. EBP is one whose effectiveness is supported by rigorous research.</i> <i>*Shown to have a positive effect on student outcomes</i> <i>*The research design allows one to infer that the practice led to child or student improvement</i> <i>*Multiple high-quality studies have been conducted</i> <i>*Reviewed by a reputable organization (e.g., What Works Clearinghouse)</i>	Rigorous
The Bridgespan Group (with Results for America and America Achieves)	Geek Cities: How Smarter Use of Data and Evidence Can Improve Lives (Part of Annie E. Casey Evidence2Success)	<i>Evidence: Research studies and evaluations that collect data in the context of a systematic and rigorous experimental design and draw conclusions regarding program effectiveness.</i> <i>Evidence-based: With reference to social programs, the condition of having one or more rigorous evaluations verify that the program delivers a significant, positive, and lasting benefit for participants and that the results are attributable to the program itself rather than another factor.</i>	Rigorous

ORGANIZATION	INITIATIVE/TITLE	DEFINITION	RIGOROUS OR GENERAL DEFINITION
Center for the Analysis of Postsecondary Readiness (CAPR)	Five Principles for Reforming Developmental Education	<i>How innovations...can improve student outcomes.</i>	General
Complete College America (CCA)	Metrics and Evidence Scaling Standards	<i>Student outcome data and other evaluation data reflecting the overall quality of the scaling effort.</i>	General
U.S. Commission on Evidence Based Policymaking	The Promise of Evidence-Based Policymaking	<i>Information that aids the generation of a conclusion...information produced by ‘statistical activities’ with a ‘statistical purpose’ that is potentially useful when evaluating government programs and policies.</i>	General
Great Schools Partnership	The Glossary of Education Reform	<i>Any concept or strategy that is derived from or informed by objective evidence—most commonly, educational research or metrics of school, teacher, and student performance.</i>	General
Institute for Higher Education Policy (IHEP)	Recommendations to Inform the U.S. Department of Education’s Research and Evaluation Set-Aside Authority	<i>Produce results that help key decision-makers implement policy and practice changes to better serve all students, and especially Black, Latinx and/or Hispanic, Indigenous, and AANHPI students, students from low-income backgrounds, and the intersectional identities within and across these groups.</i>	General
National Institute for Student Success (NISS)/Georgia State University (GSU)	Elevating Student Success at Scale	<i>Practical know-how developed by subject matter experts who have successfully implemented such programs on their own campuses.</i>	General
Office of Management and Budget (OMB)	The Foundations for Evidence-Based Policymaking Act of 2018 (“Evidence Act”)	<i>An assessment using systematic data collection and analysis of one or more programs, policies, and organizations intended to assess their effectiveness and efficiency.</i>	General

APPENDIX B: RESEARCH METHODS IDENTIFIED IN “EVIDENCE-BASED” INTERVENTIONS AND/OR PROGRAMS

ORGANIZATION	INITIATIVE/TITLE	RESEARCH METHODS
Bipartisan Policy Center	Evidence Works: Cases Where Evidence Meaningfully Informed Policy	<i>The evidence described here typically comes from statistical analysis, policy research, data science, or program evaluation.</i>
ED/IES	ESSA	<i>Based on (I) strong evidence from at least 1 well designed and well-implemented experimental study; (II) moderate evidence from at least 1 well designed and well-implemented quasi-experimental study; or (III) promising evidence from at least 1 well designed and well-implemented correlational study with statistical controls for selection bias; or (ii) (I) demonstrates a rationale based on high quality research findings or positive evaluation that such activity, strategy, or intervention is likely to improve student outcomes or other relevant outcomes; and (II) includes ongoing efforts to examine the effects of such activity, strategy, or intervention.</i>
ED/IES	WWC	<p>—Strong evidence, the highest tier, needs to be based on at least 1 well-designed, well-implemented experimental study demonstrating a statistically significant and positive effect of a project component on a relevant outcome. ED regulations require this study to meet What Works Clearinghouse evidence standards without reservations.</p> <p>—Moderate evidence needs to be based on at least 1 well-designed, well-implemented quasi-experimental design study demonstrating a statistically significant and positive effect of a project component on a relevant outcome. ED regulations require this study to meet What Works Clearinghouse evidence standards with or without reservations.</p> <p>—Promising evidence needs to be based on at least 1 well-designed, well-implemented correlational study with statistical controls for selection bias demonstrating a statistically significant and positive effect of a project component on a relevant outcome. It is not necessary for this study to meet What Works Clearinghouse evidence standards or be reviewed by the WWC.</p> <p>—The lowest tier, evidence that demonstrates a rationale, does not need to be based on research with a statistically significant finding or that has been reviewed by the WWC, but should indicate that the project component is likely to improve a relevant outcome.</p>

ORGANIZATION	INITIATIVE/TITLE	RESEARCH METHODS
Mathematica	Education to Workforce Indicator Framework	<p>Causal research is the most rigorous type of evidence available to gauge the effectiveness of a practice in the context studied. Causal research includes experimental studies (also known as randomized control trials, in which individuals are randomly assigned to the intervention or a control condition) and quasi-experimental studies, such as those identifying a matched comparison group similar to the intervention group based on available baseline data. Other types of research, such as descriptive or correlational studies, can point to promising practices and inform our understanding of a problem and potential solutions, but these studies do not conclusively show whether a practice was effective. Newer practices, programs, and interventions, or those more difficult to evaluate using experimental or quasi-experimental methods, may be promising but understudied. Therefore, the rigor of the available research is an important consideration, but not the only one, for assessing the evidence.</p>
MDRC	College Completion Strategy Guide	<p>Includes experimental, quasi-experimental, meta-analyses, descriptive data, qualitative research, and implementation and cost studies.</p>
CAPR	Five Principles for Reforming Developmental Education	<p>Impact and implementation studies</p>
CCA	Metrics and Evidence Scaling Standards	<p>Where possible, the Complete College Alliance Team should support rigorous causal research to understand what elements of the intervention had the greatest impact on student performance.</p>
Great Schools Partnership	The Glossary of Education Reform	<p>While research and “quantitative” numerical data are arguably the most common forms of evidence used in education and school reform, educators also use a wide variety of “qualitative” information to diagnose student-learning needs or improve academic programming, including discussions with students and parents, work products created by students and teachers, the results of surveys completed by students and school staff, or observations of teaching—among many other possible forms of evidence.</p>

ORGANIZATION	INITIATIVE/TITLE	RESEARCH METHODS
IHEP	Recommendations to Inform the U.S. Department of Education’s Research and Evaluation Set-Aside Authority	Evaluations, data collection, and data analysis
NISS (GSU)	Elevating Student Success at Scale	Primarily predictive analytics advising successfully used by GSU.
OMB	The Foundations for Evidence-Based Policymaking Act of 2018 (“Evidence Act”)	Evidence includes administrative records —a source of evidence consisting of qualitative or quantitative data collected or produced as part of a program’s operation; policy analysis —a source of evidence consisting of a systematic process of identifying and comparing potential options for addressing a policy problem based on certain criteria and choosing the option that best meets the criteria; program evaluation —an assessment using systematic data collection and analysis of one or more programs, policies, and organizations intended to assess their effectiveness and efficiency; performance measurement—the ongoing monitoring and reporting of a program’s accomplishments and progress, particularly towards its pre-established goals; [and] statistical analysis —a form of evidence that uses quantitative measurements, calculations, models, classifications, and/or probability sampling methods to describe, estimate, or predict one or more conditions, outcomes, or variables, or the relationships between them.

APPENDIX C: TIERS OF EVIDENCE AND EXAMPLES FROM MATHEMATICA

	TIER 1: CAUSAL	TIER 2: CORRELATIONAL	TIER 3: DESCRIPTIVE
DESCRIPTION	“...compares ‘apples to apples’ outcomes by ensuring the only difference between the group is supported by the practice and a comparison group the practice itself.”	“...suggests a relationship between the practice and outcomes (for example, showing individuals supported by the practice had better outcomes than those who were not).”	“...summarizes the outcomes of individuals supported by the practice over a period of time (for example, showing outcomes improved after the practice was implemented).”
INTERVENTION	<p>Inside Track Student Coaching to help students “... develop a clear vision of their goals...and to support them in building skills, including time management, self-advocacy.”</p> <p>More information: https://journals.sagepub.com/doi/10.3102/0162373713500523</p>	<p>College Now, CUNY Dual Enrollment program</p> <p>More information: https://eric.ed.gov/?id=EJ971010</p>	<p>Accelerated Learning Program, an English co-requisite model with extended instructional time and academic support services.</p> <p>More information: https://alp-deved.org/about-alp/</p>
EVIDENCE	One Randomized Control Trial (RCT) study found “Students who were randomly assigned to a coach were more likely to persist during the treatment period and were more likely to be attending the university 1 year after the coaching had ended. Coaching also proved more cost-effective method of achieving retention and completion gains when compared with previously studied interventions such as increased financial aid.”	Quasi-experimental (QED) study found “...enrolling in a College Now dual enrollment course reduces time to degree, not only by allowing students to earn college credits before entering college but also by increasing the number of college courses students take once they a reenrolled in college. Furthermore, we find that the program also increases students’ academic performance as measured by higher college grade point average.”	A study using linear regression and propensity score matching found “...improved students’ likelihood of passing English Composition I in the first and second years, and increased the number of college-level credits they completed overall...student completion rates in the College Composition course have doubled compared the stand-alone sequential developmental model.”

Source: Gonzalez, Naihobe, Elizabeth Alberty, Stacey Brockman, Tutrang Nguyen, Matthew Johnson, Sheldon Bond, Krista O’Connell, Adrianna Corriveau, Megan Shoji, Megan Streeter, Jennifer Engle, Chelsea Goodly, Adrian N. Neely, Mary Aleta White, Mindelyn Anderson, Channing Matthews, Leana Mason, and Sheryl Felecia Mean. “Education-to-Workforce indicator framework: Using data to promote equity and economic security for all.” Seattle: Mathematica, August 2022. Available at https://educationtoworkforce.org/sites/default/files/2023-04/E-W-Indicator-Framework_Final.pdf

APPENDIX D: TIERS OF EVIDENCE AND EXAMPLES FROM MDRC

	TIER 1: CAUSAL	TIER 2: DESCRIPTIVE	TIER 3: QUALITATIVE, IMPLEMENTATION
DESCRIPTION	<ul style="list-style-type: none"> Experimental research, which employs methods that test a causal relationship (for example, randomized controlled trials), is used to support causal statements. Quasi-experimental research, which employs methods that infer a causal relationship (for example, regression discontinuity, pretest-posttest, or interrupted time series), is used to support possible causal statements. Meta-analyses are used to share findings and analyses across experimental and quasi-experimental research studies. They may include the estimated effects of interventions 	<p>Descriptive data are used to discuss trends related to the characteristics, activities, outcomes, or experiences of a population, but are not used to infer causality.</p>	<ul style="list-style-type: none"> Qualitative research is used to illuminate the experiences of program participants. Implementation studies and cost studies provide insight into what staffing, financial, or other investments are required to implement an intervention well.
INTERVENTION	<p>Corequisite remediation in TX urban community colleges helps students progress quicker in courses and persist</p> <p>More information: https://www.tandfonline.com/doi/full/10.1080/19345747.2021.1932000</p>	<p>Presence of Black faculty member is positively associated with black student persistence in STEM programs</p> <p>More information: https://www.sciencedirect.com/science/article/abs/pii/S027275710001111?via%3Dihub#preview-section-abstract</p>	<p>MDRC's Scaling Up College Completion Efforts for Student Success (SUCCESS) project integrates components from coaching, full-time enrollment, financial incentives, and data-driven management</p> <p>More information: https://www.mdrc.org/sites/default/files/Lumina_Success.pdf</p>
EVIDENCE	<p>One Randomized Control Trial (RCT) study found “students assigned to corequisite remediation in English were 18 percentage points more likely to complete college-level English class within two years than students assigned to traditional developmental education courses.”</p>	<p>Using administrative data from 13 public 4-year Ohio universities between 1998 and 2002 and linear probability modeling, the study found “having a Black instructor increases the likelihood that black students persist in a STEM field.”</p>	<p>A qualitative study using over 100 interviews with students and program staff members reflected the experiences of participants and can be used to enhance other student support programs.</p>

Source: MDRC in partnership with SHEEO, TICAS, the Education Trust, College Completion Strategy Guide, accessed July 2023 from <https://www.mdrc.org/college-completion-strategy-guide>